

THE CLAIMS

We claim:

- 5 1. A method of forming a golf ball comprising the steps of
 - (a) forming a golf ball core;
 - (b) forming an inner cover layer around said golf ball core with a material having a first shore D hardness, wherein forming the inner cover layer comprises molding the inner cover material; and
 - 10 (c) casting an outer cover layer of less than about 0.05 inches around said inner cover layer and golf ball core with a thermoset material having a second shore D hardness less than the first, wherein casting the outer cover layer comprises:
 - (i) placing the golf ball core in core holder;
 - (ii) gelling the thermoset material to a viscosity of between 2,000 cps to
 - 15 30,000 cps in the first mold half;
 - (iii) placing the golf ball core in to the gelling thermoset material in the first mold half;
 - (iv) disengaging the golf ball core from the core holder after a selected period of time;
 - 20 (v) placing the golf ball core, while still in said first mold half with the thermoset material against a second mold half having additional thermoset material and mating the two mold halves together; and
 - (vi) curing the thermoset material in the mated mold halves.
- 25 2. The method of claim 1, wherein the inner cover layer is formed of a material having a shore D hardness that is about 5 to about 50 greater than the shore D hardness of the thermoset material forming the outer cover layer.
3. The method of claim 1, wherein the inner cover layer is formed from at least one material selected from the group consisting of an ionomer resin, a polyurethane, a
- 30 polyetherester, a polyetheramide, a polyester, a dynamically vulcanized elastomer, a functionalized styrene-butadiene elastomer, a metallocene polymer, nylon, and acrylonitrilebutadiene-styrene copolymer.

4. The method of claim 1, wherein the outer cover layer thermoset material has a shore D hardness in the range of about 30 to about 60.
5. The method of claim 4, wherein the outer cover layer thermoset material has a shore D hardness in the range of about 35 to about 50.
- 5 6. The method of claim 5, wherein the outer cover layer thermoset material has a shore D hardness in the range of about 40 to about 45.
7. The method of claim 1, wherein the step of casting the thermoset material of the outer cover layer further comprises the step of a mixing a prepolymer and a curing agent in a motorized mixer.
- 10 8. The method of claim 7, wherein the step of casting the thermoset material of the outer cover layer further comprises heating first mold half during the casting process prior to gelling the thermoset material in the first mold half.
9. The method of claim 1, wherein the thermoset material of the outer cover layer comprises at least one of a thermoset urethane, a polyurethane, a thermoset urethane ionomer, or a thermoset urethane epoxy.
- 15 10. The method of claim 1, wherein the outer cover layer thickness is from about 0.02 to about 0.04 inches thick.
11. A method of forming a golf ball comprising the steps of
- (a) forming a golf ball core;
- 20 (b) forming an inner cover layer around said golf ball core with a material having a first shore D hardness, wherein forming the inner cover layer comprises molding the inner cover material; and
- (c) casting an outer cover layer of less than about 0.05 inches around said inner cover layer and golf ball core with a thermoset material having a second shore D hardness less than the first, wherein casting the outer cover layer comprises:
- 25 (i) placing the golf ball core in core holder;
- (ii) gelling the thermoset material to a viscosity of between 2,000 cps to 30,000 cps in the first mold half;

(iii) placing the golf ball core in to the gelling thermoset material in the first mold half;

(iv) disengaging the golf ball core from the core holder after a selected period of time;

5 (v) placing the golf ball core, while still in said first mold half with the thermoset material against a second mold half having additional thermoset material and mating the two mold halves together; and

(vi) curing the thermoset material in the mated mold halves;

10 wherein the inner cover layer is formed of a material having a shore D hardness that is about 5 to about 50 greater than the shore D hardness of the thermoset material forming the outer cover layer.

12. The method of claim 11, wherein the inner cover layer is formed from at least one material selected from the group consisting of an ionomer resin, a polyurethane, a
15 polyetherester, a polyetheramide, a polyester, a dynamically vulcanized elastomer, a functionalized styrene-butadiene elastomer, a metallocene polymer, nylon, and acrylonitrilebutadiene-styrene copolymer.

13. The method of claim 11, wherein the outer cover layer thermoset material has a shore D hardness in the range of about 30 to about 60.

20 14. The method of claim 13, wherein the outer cover layer thermoset material has a shore D hardness in the range of about 35 to about 50.

15. The method of claim 14, wherein the outer cover layer thermoset material has a shore D hardness in the range of about 40 to about 45.

25 16. The method of claim 11, wherein the step of casting the thermoset material of the outer cover layer further comprises the step of a mixing a prepolymer and a curing agent in a motorized mixer.

17. The method of claim 16, wherein the step of casting the thermoset material of the outer cover layer further comprises heating first mold half during the casting process prior to gelling the thermoset material in the first mold half.

18. The method of claim 11, wherein the thermoset material of the outer cover layer comprises at least one of a thermoset urethane, a polyurethane, a thermoset urethane ionomer, or a thermoset urethane epoxy.

19. The method of claim 11, wherein the outer cover layer thickness is from about 0.02 to
5 about 0.04 inches thick.